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INTERGOVERNMENTAL NEGOTIATING COMMITTEE
FOR A FRAMEWORK CONVENTION ON CLIMATE CHANGE

EXECUTIVE SUMMARY OF THE NATIONAL COMMUNICATION OF

CANADA

submitted under Articles 4 and 12
of the
United Nations Framework Convention on Climate Change

In accordance with decision 9/2 of the Committee, the interim secretariat is to make available, in the official languages of the United Nations, the executive summaries of the national communications submitted by Annex I Parties.

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Copies of the Canadian national communication can be obtained from:
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CANADA

1. Canada's National Report on Actions to Meet Commitments under the United Nations Framework Convention on Climate Change provides a snapshot of action currently being taken by Canadian governments, non- governmental organizations, communities and the private sector to meet domestic and international climate change commitments.

2. Under the Framework Convention on Climate Change, countries must adopt measures to mitigate climate change, adapt to its possible effects, increase public awareness and scientific understanding of climate change and possible responses, and work together in all of these areas. As a first step, Canada has established a national goal to stabilize net emissions of greenhouse gases not controlled by the Montreal Protocol at 1990 levels by the year 2000. Canada must submit a report on actions being taken to meet its commitments under the Convention six months after it enters into force, and on a regular basis thereafter.

3. At the 1992 United Nations Conference on Environment and Development, Canada announced a "quick-start" agenda that included a commitment to produce its first national report in 1993. A draft was released in September 1993 by the co-chairs of the National Air Issues Co-ordinating Committee (NAICC) for public review and comment. This review process provided Canadians with an opportunity to comment on a number of reporting and assessment issues and, more generally, on the shape and direction of Canada's response to climate change. Many comments and suggestions regarding the national report have been incorporated.

4. This national report provides governments, non-government stakeholders and individual Canadians with a foundation for understanding Canada's situation and for determining the extent of further action needed to meet Canada's climate change goals.

Canada and Climate Change

5. There is general agreement in the international scientific community that increasing the atmospheric concentration of greenhouse gases will result in global warming. There are, however, uncertainties about the timing and regional magnitude. Clearly, projections of the possible impact of climate change in Canada must be treated with some caution.

6. These projections indicate that climate change could result in significant changes to many of Canada's natural ecosystems. For example, there could be wider variations in temperature, a rapid northward shift of climatic zones, lower water levels in the Great Lakes-St. Lawrence Basin, rising sea levels along Canada's coasts and increased land instability in northern Canada as a result of permafrost decay. The consequences for wildlife,

human communities and the Canadian economy could be significant. Research is continuing in Canada to improve scientific understanding of climate change and its possible impact.

7. Canadian demand for energy — to heat and light homes; operate industries, farms and businesses; and move people and products from place to place — is the chief cause of anthropogenic greenhouse gas emissions. Canada is an energy-intensive country because of unique characteristics such as a low population density, large distances between urban centres, cold climate, relatively affluent lifestyles and a reliance on energy-intensive economic activities.

8. Fossil fuels (coal, oil and natural gas) meet close to three quarters of Canada's total primary energy demand. The remainder is supplied by hydro and nuclear power, and other renewable (mainly biomass) sources. Solar and wind power currently meet only a very small portion of Canada's overall energy needs, primarily for niche applications such as hot-water heating, navigational buoys and irrigation water pumps. Efforts by Canadians to improve energy efficiency also play an important role in Canada's efforts to manage its energy resources.

9. These, and other, national circumstances have shaped Canada's unique national greenhouse gas emissions profile, and provide insight into the challenges and opportunities Canada faces in responding to climate change.

10. Canada's federal, provincial/territorial and municipal governments share responsibility for areas where action can be taken to address climate change. The draft National Action Strategy on Global Warming provides a framework for action by government and non-government stakeholders to limit greenhouse gas emissions, adapt to the possible effects of climate change and improve scientific understanding.

Action Taken by Canada to Address Climate Change

11. As a first step in meeting Canada's stabilization commitment, governments, utilities, private corporations and community organizations are developing and implementing measures to limit greenhouse gas emissions. These measures make economic sense in their own right, or serve multiple policy objectives. Canada has adopted a comprehensive approach that addresses emissions of all greenhouse gases from anthropogenic sources and the sequestering of these gases by sinks. This approach provides Canadians with the flexibility to meet Canada's climate change objectives in a cost-effective manner.

12. Measures already taken in Canada seek to limit emissions or enhance the capacity of sinks using a range of policy instruments, including information and education initiatives, voluntary measures, regulation, research and development, and economic instruments. Action

has been taken in the following sectors: transportation, electricity generation, residential and commercial, resource and manufacturing industries, and waste management.

13. The majority of measures taken in Canada have been aimed at increasing energy efficiency and energy conservation or encouraging a switch to energy sources that are less carbon intensive. There are also measures in place to address non-energy sources of greenhouse gases and to enhance carbon sinks in the forestry and agricultural sectors.

14. While limiting greenhouse gas emissions is fundamental to mitigating climate change, the Framework Convention on Climate Change is based on the principle that an effective response also requires adaptation, education, research and international co-operation. Steps have been taken in Canada to address climate change in all of these areas.

15. Canada is studying actions that may be needed to adapt to possible changes in the world's climate. This work involves examining how Canadians have adapted to Canada's many diverse climatic zones. Also under way are assessments that integrate the projected environmental, social and economic effects of climate change on different economic sectors and regions of Canada

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16. Many Canadian organizations are working to increase public awareness of climate change through education and information campaigns, conferences and contributions to school curricula. These educational activities are based on the premise that Canadians will be more likely to support action to address climate change, and take action voluntarily, if they become "environmental citizens" with a better understanding of the linkages between their actions and the impact on the environment.

17. Canadians from different sectors of society are working together to reduce scientific and socio-economic uncertainties with respect to climate change. Efforts are being made to improve the collection of past and current climatological data in Canada, and Canada continues to improve its ability to study possible future climates with its general circulation model. Canada is also involved in several international studies to improve understanding of the processes through which the various elements (i.e., atmosphere, oceans, land) of the climate system interact, particularly in the northern regions of the planet. Finally, there is research under way on the possible impact of climate change and the socio-economic implications of measures to limit greenhouse gas emissions.

18. At the international level, Canada contributes funding for developing country participation in fora such as the Intergovernmental Panel on Climate Change and the Intergovernmental Negotiating Committee of the Climate Change Convention.

19. The contribution of developing countries to global greenhouse gas emissions is increasing, and Canada is helping these countries meet their own commitments under the Convention by providing financial and technical resources through the Global Environment Facility and bilateral channels. This support assists developing countries in the preparation of

country studies that examine their current situation. It also helps to limit greenhouse gas emissions and facilitate adaptation to climate change.

Assessing Canada's Progress in Mitigating Climate Change

20. Observed or projected changes in emission trends provide only partial insight into how Canada is doing in meeting its climate change objectives. Factors such as energy prices, economic output levels, energy use patterns, land use changes, technological developments and changes in behaviour all influence emission trends.

21. Canada is developing an integrated approach to assess progress towards meeting its emission limitation commitments. This approach seeks to understand how actions to limit emissions interrelate with other factors to change past and future emission trends. Such an understanding is necessary to ensure that actions have a real and sustained impact on emission levels.

22. This report describes four tools used to assess progress in limiting emissions.

Emissions Inventories

23. Annual emissions inventories provide a tool for assessing progress in limiting emission levels and also provide a crucial reference point for other assessment tools (i.e., climate change indicators, emissions outlooks and case studies).

24. In 1990, Canada's total energy-related and non-energy-related emissions of the three major anthropogenic greenhouse gases, carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O), were equivalent to 526 megatonnes (Mt) of CO_2 emissions, as calculated on the basis of their global warming potential over a 100-year period. CO_2 accounted for 87% of these emissions, with CH_4 and N_2O accounting for 8% and 5% respectively.

25. Energy production and consumption generated 98% of Canada's anthropogenic CO_2 emissions in 1990. The major sources of emissions were the transportation sector (32%), electricity generation (20%) and industrial sources (16%).

Climate Change Indicators

26. Canada has begun developing climate change indicators to understand the relationship between emission trends and underlying social, economic, technological, and behavioural factors.

27. During the 1960s and 1970s, CO_2 emissions in Canada grew at a rapid pace of 4% a year, fuelled by strong per capita output and population growth. Emissions then

declined, beginning in 1980 as Canadians responded to higher energy prices and large-scale government efficiency and conservation programs. In 1986, CO_2 emissions began rising again as oil prices collapsed and both the public and private sectors reduced emphasis on energy efficiency and conservation programs.

28. After reaching a historical peak of 487 Mt in 1989, energy-related CO_2 emissions fell in 1990 to 461 Mt. The Canadian economy was in recession, above average winter temperatures were experienced in many regions of the country and high water levels allowed hydro-electricity to temporarily displace electricity normally produced from coal-fired generators. As the economy climbs out of the recent recessionary period, emissions are expected to rise once again, unless the relationships between emissions and human production and consumption activities are altered. In fact, CO_2 emissions fell a further 6 Mt in 1991, but preliminary estimates show they were on the rise again in 1992.

Emissions Outlook

29. This national report includes an outlook for future energy-related emissions of the three primary greenhouse gases, CO_2, CH_4 and N_2O, to the year 2000. In aggregate, the energy sector accounts for 88% of these gases. Emissions from non-energy sources — representing 12% of Canada's total emissions — are not included. Also not included in the outlook is the removal of greenhouse gases from the atmosphere through the protection and enhancement of sinks.

30. Based on certain key assumptions and the continuation of existing policies, programs and measures, the outlook shows that energy-related emissions of CO_2, CH_4 and N_2O will be equivalent to about 538 Mt of CO_2 in the year 2000. This means that the emission level in 2000 will be 52 Mt, or close to 11% higher, than the 1990 level.

31. This outlook is one of many plausible views of the future. It is sensitive to underlying macro-economic assumptions, such as energy prices, the structure of the economy and economic growth. Changes to any one of these will lead to very different outcomes. For example, a US$5 decrease in world oil prices would increase the CO_2 emissions "gap" by about 30% in the year 2000. A continuation of historical growth trends in the goods and services sectors would reduce the gap by about 30%. And increasing or decreasing economic output by 1% would enlarge or reduce the size of the gap by roughly 60% in the year 2000. In addition, this outlook incorporates the effects of only those federal and provincial energy and environmental policies, programs and measures currently in place or close to implementation. In other words, no assumptions have been made about future changes in these actions or additional ones that may be undertaken. In some instances, however, assumptions have been made about the extent to which certain initiatives are implemented by various jurisdictions.

32. Emissions outlooks are an important tool for understanding how various factors can drive the anticipated growth in emissions and the progress Canada is making towards

achieving its climate change objectives. They must be used in conjunction with the other assessment tools discussed in this national report when considering the scope and nature of additional measures to limit emissions.

Case Studies

33. The use of case studies to assess the effectiveness of measures to limit greenhouse gas emissions from selected areas of economic activity offers a bottom-up analysis of policy effects that complements top-down assessment tools such as emissions outlooks and climate change indicators.

34. This national report includes one case study to illustrate the value of this assessment tool. It concludes that current and planned measures to limit greenhouse gas emissions associated with space heating requirements in new single-family homes will reduce emissions in this area by 18% from what they would otherwise be in the year 2000.

Summary

35. The initial assessment of Canada's progress towards meeting its climate change objectives indicates that additional measures are needed if Canada is to meet these objectives. In response to this conclusion, federal and provincial/territorial energy and environment ministers, at their joint meeting in November 1993, instructed their officials:

> ...to proceed with the development of options that will meet Canada's current commitment to stabilize greenhouse gas emissions by the year 2000 and to develop sustainable options to achieve further progress in the reduction of emissions by the year 2005.

36. A process has been established to develop and recommend to federal and provincial/territorial energy and environment ministers a national action program designed to meet Canada's climate change goals. This process is based on a new Comprehensive Air Quality Framework that encourages all jurisdictions in Canada to co-ordinate, and co-operate in, the management of all air issues, including acid deposition, smog, ozone depletion and, of course, climate change. This framework is being implemented by means of a National Air Issues Co-ordinating Mechanism.

37. Part of the new co-ordinating mechanism is a national Task Group on Climate Change. This multi-stakeholder group of government, business, labour, consumer and environmental members has accepted responsibility for completing this, and future, national reports, providing advice to the federal government regarding positions Canada should be taking during international climate change negotiations, and developing a national action program to achieve Canada's climate change goals.

38. Achieving the goals set by Canada on climate change is a challenging task, one that requires the efforts and co-operation of all government and non-government stakeholders. It is also a challenge that must be met by individual Canadians in their daily lives if long-term, sustainable progress in addressing climate change is to be made. As part of this effort, Canada will continue developing assessment tools to determine if such progress is being achieved. The integrated approach to assessment is an evolving one that will benefit from future contributions provided by related activities under way domestically and internationally.